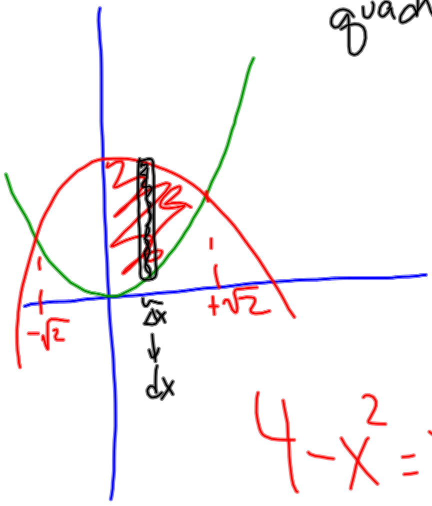
Find the area between $y=x^2$ and $y=4-x^2$ in the first quadrant.

$\lim\limits_{\max \Delta x_i \to 0} \sum_{k=1}^{\infty} \boxed{(4-x_i^2)-x_i^2}\,\Delta x$ height of rect



$$\text{Area} = \int_{\boxed{0}}^{\boxed{\sqrt{2}}} \boxed{(4-x^2)-(x^2)}\, d\boxed{x}$$

$4-x^2=x^2$

$4=2x^2$

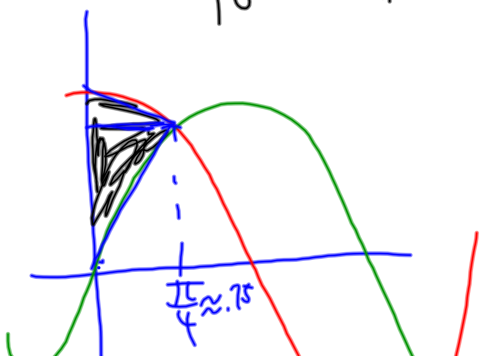
$2=x^2$

$$=\int_0^{\sqrt{2}} 4-2x^2\,dx = \left(4x-\frac{2}{3}x^3\right)\Big|_0^{\sqrt{2}}$$

$$=\left(4\sqrt{2}-\frac{2}{3}(2\sqrt{2})\right)-0=\frac{8}{3}\sqrt{2}$$

Find area in Q1 between $y=\sin x$ and $y=\cos x$ for the 1st "region"

fnInt$(\cos x-\sin x,\ x,0,\pi/4)=$



$\sin x=\cos x$

$x=\frac{\pi}{4}$

$A\approx\frac{1}{2}bh$

$\approx\frac{1}{2}(1)(.75)$

$=.38$

$$\int_0^{\frac{\pi}{4}} \cos x-\sin x\,dx$$

$$(\sin x+\cos x)\Big|_0^{\frac{\pi}{4}}$$

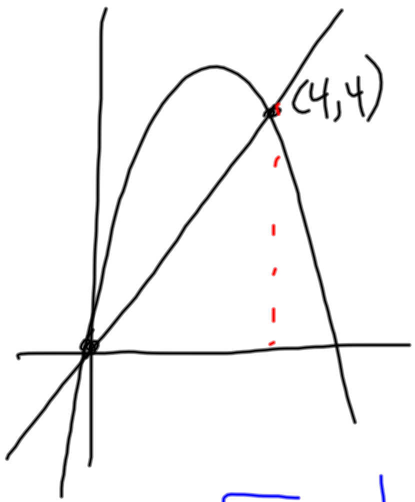
$\sin(\frac{\pi}{4})+\cos(\frac{\pi}{4})=\frac{1}{\sqrt{2}}+\frac{1}{\sqrt{2}}=\frac{2}{\sqrt{2}}$

$\sin(0)+\cos(0)=0+1=1$

$$\frac{2}{\sqrt{2}}-\frac{\sqrt{2}}{\sqrt{2}}=\frac{2-\sqrt{2}}{\sqrt{2}}$$

Feb 4-7:27 AM

1) Find the area btw $y=5x-x^2$ and $y=x$



$$\text{Area}=\int_{x=0}^{x=4} (5x-x^2)-(x)\,dx$$

$$=\int_0^4 4x-x^2\,dx=\left(2x^2-\frac{x^3}{3}\right)\Big|_0^4$$

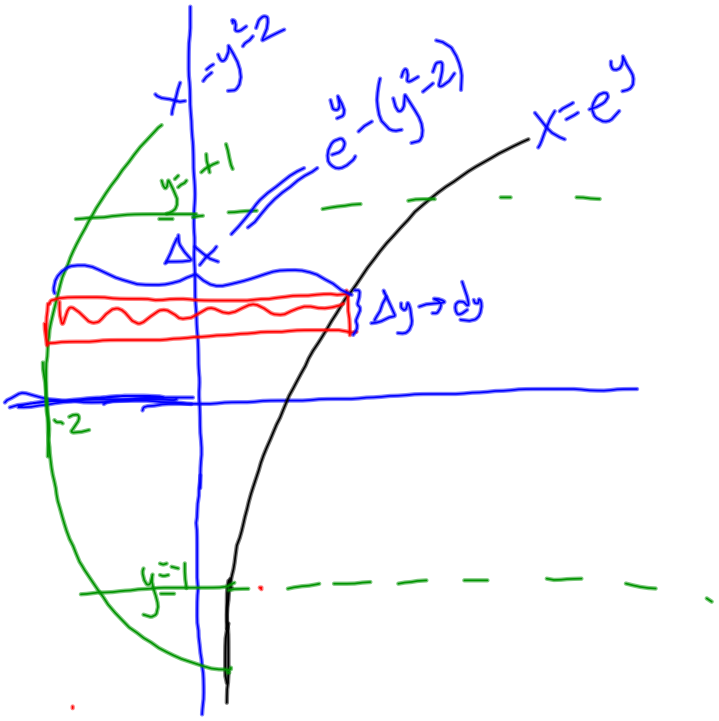
$$=\left(32-\frac{64}{3}\right)-(0)=\frac{32}{3}$$

2) Ftab $y=\sqrt{x+2}$ and $y=\frac{1}{x+1}$ [0,2]

$$A=\int_0^2 (x+2)^{1/2}-\frac{1}{x+1}\,dx=\left[\frac{2}{3}(x+2)^{3/2}-\ln(x+1)\right]\Big|_0^2=\left(\frac{16}{3}-\ln 3\right)-\left(\frac{4\sqrt{2}}{3}-0\right)$$

$$=\frac{16}{3}-\frac{4\sqrt{2}}{3}-\ln 3$$

3) FtAb $x=y^2-2$, $x=e^y$, $y=-1$, and $y=1$.



$$\text{Area}=\int_{y=-1}^{y=+1} (e^y)-(y^2-2)\,dy$$

$$=\int_{-1}^{1} e^y-y^2+2\,dy$$

$$=\left(e^y-\frac{y^3}{3}+2y\right)\Big|_{-1}^{1}$$

$$=\left(e-\frac{1}{3}+2\right)-\left(\frac{1}{e}+\frac{1}{3}-2\right)=\ldots$$